DOCUMENT RESUME

ED 309 789 IR 052 980

TITLE IFLA General Conference, 1987. Division of Management and Technology. Library Building and Equipment Section. Information Technology Section. Papers.

INSTITUTION International Federation of Library Associations, The Hague (Netherlands).

PUB DATE Aug 87

NOTE 29p.; Papers presented at the International Federation of Library Associations (IFLA) General Conference (53rd, Brighton, England, August 16-21, 1987). For related documents, see IR 052 979 and ED 299 988-ED 300-013.

PUB TYPE Speeches/Conference Papers (150)

EDRS PRICE MF01/PC02 Plus Postage.

DESCRIPTORS Building Design; Computer Software; Developed Nations; *Fees; Foreign Countries; Information Networks; *Information Technology; *Library Facilities; Library Materials; *Library Services; National Libraries; *Online Catalogs; *Optical Data Disks; Public Libraries; Technological Advancement

ABSTRACT

The six papers in this collection focus on library buildings and equipment and information technology: (1) "Library Equipment in a Changing Library Environment" (Margaret Beckman, Canada); (2) "The New Building for the British Library" (Colin St. John Wilson, United Kingdom); (3) "User Interaction with Online Catalogue" (Stephen Walker, United Kingdom); (4) "Charging for Public Library Services" (J. C. Beard, United Kingdom); (5) "The Electronic Aristocracy: Some Causes for Concern" (Trevor Haywood, United Kingdom); and (6) "CD ROMance: An Overview of Compact Disc Read Only Memory" (Edward Kurdyla and Kenneth Harris, United States). (CGD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED309789

53rd IFLA COUNCIL
& GENERAL CONFERENCE
BRIGHTON, UNITED KINGDOM
16 – 21 AUGUST 1987

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
X This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Division of Management and Technology

SECTION ON LIBRARY BULDING AND EQUIPMENT

Session: 87 Tuesday 08.30 – 10.00

Library equipment in a changing library environment *(122-BUIL-1-E)*	Margaret Beckman University of Guelph Ontario Canada
The new building for the British Library *(123-BUIL-2-E)*	Colin St. John Wilson Architect London UK

SECTION ON INFORMATION TECHNOLOGY

Sessions: 115 Tuesday 15.00 – 16.30
129 Tuesday 17.00 – 18.30

User interaction with online catalogues *(17-INF-1-E)*	Stephen Walker Polytechnic of Central London UK

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
A.L. Van Wesemael
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Division of Management and Technology
Division of Libraries Serving the General Public

SECTION ON INFORMATION TECHNOLOGY SECTION OF PUBLIC LIBRARIES

Joint Meeting
Session: 176 Wednesday 17.00 – 18.30

Charging for public library services *(61-PUBL-2/INF-2-E)*	J C Beard Hampshire County Library Winchester UK
The electronic aristocracy: some causes for concern *(84-PUBL-3/INF-3-E)*	Trevor J Haywood City of Birmingham Polytechnic Perry Barr Birmingham UK

IR052 980

BEST COPY AVAILABLE

Data conversion by Saztec Europe
as a contribution to IFLA 1987

LIBRARY EQUIPMENT IN CHANGIN LIBRARY ENVIRONMENT

Margaret Beckman, *Executive Director for Information Technology, University of Guelph, Guelph, Ontario, Canada*

ABSTRACT

The increase in the assimilation of information technologies into the library environment have implications for library equipment and the furnishings which houses it. Planning becomes an important component of equipment selection and housing, and attention to electrical and communications requirements becomes critical. Flexibility in all aspects of equipment housing and placement is recommended as the best way to ensure that library equipment will continue to meet the needs of library users and the staff who serve them.

I. Introduction

It is impossible to present a discussion of library equipment in a changing library environment without first giving very careful considerations to that environment. For the environment is not only changing rapidly, but the response to it – from library users as well as from library staff – has assumed far more importance than at anytime previously.

II. Changing library environment

1. Collection formats

For the past five centuries libraries and librarians have been concerned with housing and preserving printed media, and our concerns have related to the quality of paper and the effects of heat, light and humidity on it. In the short period since the Second World War our whole world has changed, as we have experienced, in increasingly rapid succession, microfilm, microcards, microfiche, phonorecordings, film, audio and video cassettes. Now we are faced with an even greater increase in the speed with which new formats appear, as compact and laser disk technology, and computers which are their genesis, totally revolutionize the storage of information, as well as the access to it, its retrieval and its transfer.

2. Technical services

In the library technical service area equipment problems are very complex, because each collection format has different needs, as do the library staff performing the various functions – bibliographic searching, ordering, receiving, serials check-in, cataloguing, material preparation. A cataloguer, for example, may need to access a microfiche file, a compact disk data base, the online catalogue of another library or of a bibliographic utility, the local online catalogue and shelflist – all to acquire sufficient information to correctly catalogue and classify one book. The question is how much equipment is essential for each individual work station? Must each technical service worker be supplied with a microcomputer and a microfiche reader, as well as space for all the printed tools with which most of us are familiar? How does the work flow in a library technical services area change to accommodate the changing collection formats and their various types of equipment. Even more important is the question, how does the library staff organization change to maximize efficient use of this equipment?

3. Public services

Changes are just as dramatic in the user area of the library except that there is a little more space in which to operate; an individual user would be unreasonable if he expected the library to provide each carrel or study table with all the equipment he/she would need for his/her collection access. At the same time librarians must recognize that the old response of isolating each new and different format and its associated equipment in a separate room is no longer acceptable. In addition to being a great inconvenience to the user who comes to the library for information, not for the type of container it may happen to be in, this response is also labour intensive. Separate rooms with staff members in attendance for microforms, maps, audio-visual, compact disks, computer software, etc., are both unnessary and inefficient.

As well, library users are becoming increasingly computer literate. In many libraries, beginning with special libraries such as law and medicine but expanding to include academic, users expect to be able to do their own searching. End-user searching is now a reality. In addition to issues of fees and copyright which this phenomena raises, the library buildings and the equipment is houses must also adjust.

The most important implication which these new "information technologies" have for libraries, however, is the changed role which the library may be asked to play. Should the academic library, as Patricia Battin suggests, be the information technology centre of the campus, providing microcomputer laboratories for teaching, and scholars work-stations for research as well as for direct user access.[1] How do similar services fit into the public library?

III. Equipment: planning and impact

In order to respond to the changing collection formats, to the ways in which both library staff and patrons will use them, as well as to a possible expanded role for the library itself, librarians, architects, and designers must give more attention to library equipment, its housing and its special environment than has previously been given. A few years ago libraries selected desks and chairs for library staff and study tables or carrels for the users. Choices were frequently between type and colour of wood finishes or of fabric. Today, no single piece of furniture nor a single furniture system can fulfill all the needs which I have described. In fact, as Gloria Novak has pointed out "each machine station must be designed to meet the particular requirements of a specific function or group of functions."[2] Planning, therefore, becomes a more important exercise than selection as consideration is given to the equipment in a new or renovation library project.

A number of issues need to be addressed in the planning stage of equipment acquisition:

- How is the individual piece of equipment to be used?
- What materials or tools will be used with it?
- Will this be a single-use equipment station or will many users want to use it at the same time?
- Will there be standing as well as sitting heights for this equipment use?
- What are the electrical, mechanical and communications features required?
- What is the likelihood of this technology changing so that the equipment will be replaced by something new, either larger or smaller, and with different requirements?
- Will this piece of equipment require staff assistance in its use – or surveillance for security purposes?
- Are there ergonomic implications?

These questions and many others all need attention. User surveys or user participation through consultative committees are recommended as important planning devices. Visits to other libraries which have attempted to accommodate the equipment of the new information technologies are also most helpful in assessing good equipment design and placement, or well designed equipment housing which doesn't function due to lack of attention to some of the details just listed.

Plans for telecommunications on a campus, within a school system or corporation, or in a city, county, province, state or country are also of critical importance. The use of an integrated voice and data switch for communications purposes results in different cabling and/or conduit requirements within a building. The requirements for library systems themselves must also be identified and their implications understood. In the United States, for example, access to the RLIN data base (Research Libraries Information Network) has different communications requirements than access to OCLC (Online Computer Library Center). Since some libraries belong to both systems, both sets of requirements must be met.

In summary, the equipment planning process should determine the relationship between the equipment and the furniture which will house it; between the furniture distribution system and the building distribution system; between the building system and the external environment. The routing of wires and cables, storage for excess supplies of these items, and the points at which connection outlets will be required now and in the future are specific decisions which must be determined.

2. Impact

For previous generations of library users and workers the interrelationship of library equipment and related furnishings to the user and collections required little more than attention to the quantity and quality of light. This is no longer true. Since so many library formats and library tasks are now dependent on screens of some sort – on microform readers, online catalogue terminals, microcomputers – special attention must be paid to the impact of this type of equipment on the library building. There is no question that as use of such equipment increases so do the complaints associated with it. Most common are visual complaints and fatigue, but stress and

depression are also cited. [3] The most common causes of visual problems are veiling and glare. Veiling reflections occur when interfering light or images are reflected off the object which you are looking at. Glare occurs when the light source within your sight is brighter than the object you are viewing.

Other problems, both visual and fatigue, are associated with the nature of equipment use. A user – whether in the public or technical service area – will be involved with at least three if not four different but interrelated tasks, each located in close but different positions: the screen, the keyboard, the writing work surface, and possibly a printed reference source. The user's eye must change its focus for the four different distances and surfaces, and eye strain is added to the fatigue caused by lighting deficiencies.

Shemitz and Walker have identified problems with existing lighting systems and suggest solutions for the visual and fatigue complaints. They feel that all fluorescent ceiling mounted fixtures, whether louvered or baffled, upward or downward facing, produce both glare or veiling effects. Their solution is to have a task lighting system which positions the lamp in front of the user, has baffles to eliminate glare and veiling, a diffuser to control the upwardly directed light, and reflectors to move the light to different parts of the work station. [4] It goes without saying that placement of windows, light wells or atriums within a new library building will be an important and controversial issue.

3. Solutions

There are of course no easy solutions to the problems resulting from changing library formats and the equipment necessary for both staff and users in order to access, retrieve and process the information they acquire. Nor can such a brief presentation address all the issues and types of equipment which are involved. However, one over-riding design factor assumes extreme importance: flexibility.

There must be flexibility in the design of furnishings which house the equipment because the equipment size and shape as well as its electrical and communications connections may change. Panels built into the work station which hide the conduit or cables at either the base or work surface level can allow for future change.[5] Equipment bars which group a variety of electrical and telecommunications features provide flexibility for groupings of equipment in confined areas such as a circulation or information desk.[6]

Work stations – desks or carrels which are designed to allow the work surface to move up or down – will provide the flexibility necessary to meet the different needs of a vast number of different users. Another flexibile approach is to purchase a furnishing 'system' rather than individual pieces. Tables, carrels, scholar or staff work stations, and service desks all of which will house the electronic equipment we have been discussing, can be purchased as a system. A basic carrel or work station can be purchased initially, with capability to add other pieces to it as the need arises or as more money is available. As well, all of the equipment systems available today have the kind of adjustability I described earlier.

IV. Conclusion

Although the parameters of the information society are only now being established, implications for libraries – their staff and users – can already be identified. Important among these is the impact of the equipment which will be required to use the new information formats, and the furnishings which will be required to house that erquipment. As well, implications for the library building, particularly of lighting, electrical and communications services, must also be identified. In planning libraries in the next decade, flexibility, both in the design of space but also in equipment furnishings, assumes even greater importance.

References

1. Battin, Patricia. The library: center of the restructured university. *In* Current issues in higher education, 1983-84. Washington, Educom, 1985.
2. Novak, Gloria. Housing electronic equipment: Systems and computer furniture. Presentation to the Building and Equipment Section, (American Library Association) Preconference, New York, June 21, 1986.
3. Shemitz, Sylvan R. with Gladys Walker. Lighting visual display terminals – in the cause of the operator's comfort. Architectural record, October, 1983. p.138.
4. Ibid., p.140.
5. Novak, op.cit.
6. Somerville, Arleen N. The automated service desk. Presentation to the Building and Equipment Section (American Library Association) Preconference, New York, June 21, 1986.

THE NEW BUILDING FOR THE BRITISH LIBRARY

Prof. Colin St. John Wilson, *Architect, London, UK*

ABSTRACT

After an overview of the history of building plans for a new British Library, and a summing-up of the reasons for building this new library, this paper indicates the cooperation between librarians and architects to formulate the architects brief.

Various elements out of the design-stage are mentioned, such as location, exterior- and interior design, technical requirements, building phases, etc.

1. HISTORICAL BACKGROUND

The British Library is the national librtary for the United Kingdom. It was established in 1973 under Act of Parliament as the national centre for reference, lending, bibliographical and other information services based on its vast collections of books, manuscripts, maps, music, periodicals and other material. It was formed by the merging of four major national institutions: the British Museum library departments, the National Central Library, the National Lending Library for Science and Technology and the British National Bibliography Ltd. The functions of the Office for Scientific and Technical Information (OSTI) were incorporated in 1974 and in 1982 the India Office Library and Records were deposited on trust.

The need to rehouse the ever-expanding reference collections of the National Library was recognised when they were still in the care of the British Museum. In 1951 the County of London Development Plan included provision for a new building to house the Museum's library departments. The designated site was opposite the British Museum itself, in Great Russell Street. The architects Sir Leslie Martin and Colin St. John Wilson were commissioned in 1962 and their design was approved two years later.

The 1960s brought fresh stimulus to provide new accommodation. There was a growing awareness that the collections were deteriorating because of limited control over temperature, humidity and atmospheric pollution. Space, previously short, actually ran out. Readers could not find seats. Books had to be outhoused at Woolwich. It became difficult to maintain the expected standards of service.

In 1972 with the imminent formation of the British Library, Colin St. John Wilson, now heading his own practice, was given a new brief. It had been considerably enlarged to make provision for the Science Reference Library and for the proposed Bibliographic Services Division, then about to be formed from the British National Bibliography Ltd. and the British Museum's Copyright Receipt Office. The part of the brief relating to the former British Museum departments was rewritten to take its place in a specification meeting the integrated needs of a national library. It reflected the British Library's priorities of preserving the collections and providing efficient services to readers. It also had a new urgency, for the elements of the British Library in London were widely scattered. Almost from its inception, the Science Reference Library has been divided among two, three or four sites and the Bibliographic Services Division has had similar difficulties.

The enlarged project encountered resistance from the campaign to conserve the traditional buildings and character of Bloomsbury. In 1975 it was decided to plan the new library in Euston Road on a site adjacent to St. Pancras Station. In 1978 the Government of the day agreed that work on the building would begin in 1979-80. The next Government reviewed the project and in November 1980 announced the go-ahead for the new building. Work on the first stage started in April 1982. H.R.H. the Prince of Wales unveiled the foundation stone of the new British Library on 7th December 1982.

II. THE BRIEF

There are three main reasons why the British Library needs a new building: the present dispersion in inefficient, the available space for book storage will be full by 1991, and the deterioration of the stock, which suffers from the unsatisfactory nature of much of the existing accommodation, must be halted.

The library currently occupies some twenty buildings in London. This dispersion affects the staff who run the Library, the books that it holds and the readers. The books must be moved between stores and reading rooms, with inevitable damage. What's more, many readers come a long way to use the Library. They may not always know where to ask for a book, and their time is wasted while the book is fetched –

often not until the next day.

For a hundred years, the British Museum, with government help, expanded its building to house the Library which was then part of it. The task of managing the Library has increased in both scale and complexity over the past one hundred and fifty years. In 1837 there were two hundred and forty thousand volumes .... Today there are over ten and a half million. Of these only sixty thousand are held in the Round Reading Room itself. At present forty percent of the stock is outhoused at Woolwich, and at Micawber Street in North London. However, the stock continues to expand and more storage space will be needed in 1991.

If books are not to deteriorate, they must be stored in a controlled environment; they need cool clean air with low relative humidity. Polluted air and changes in the conditions of storage make paper brittle and cause damage to bindings. The Library spends six million pounds on preservation each yeaer, but it will not have coped with the backlog by the year 2000. In addition, most paper contains harmful acid: therefore as the stock increases, so does the conservation problem. The answer is to house the stock properly – that is, in an air-conditioned building.

In its final form the Brief contained 8,000 pieces of information on computer specifying environmental conditions, equipment and spatial parameters for every Department in the complex as follows:

Reading rooms, both open access as required for researchers, in science and technology, and closed access for researchers using other collections;

Storage on the same site in controlled environmental conditions with provision for growth;

Workshops and studios for conservation, binding, photography and reprography;

Exhibition galleries and workshop;

Offices for the full range of library work, including ordering, cataloguing and other functions which need to be carried out in close proximity to the collections;

Amenities for readers, general public and staff.

The intention of this brief – prepared through close co-operation between the British Library and the architects – has been to meet the needs of the Library and its users well into the next century as well as to provide scope for future adaptation.

From this it follows that a design is required that can accommodate growth in stages that permit self-sufficient phases of occupation. Such phasing relates not only to feasible logistics for moving in vast quantities of material in controllable operations but also to a realistic flexibility in expectation of the necessary financial (and therefore political) decisions that will have to be made.

III. THE DESIGN

The three major factors that have influenced the evolution of this design are first, the shape and Planning requirements of the site and its immediate neighbours. Secondly the operational brief as described, and thirdly the need to build in discrete phases as the economic situation and the logistics of moving-in permit.

The site is a wedge-shaped piece of land to the west of St. Pancras Station bounded on the South by Euston Road, the West by Ossulston Street and the East by Midland Road and its overall area is of the order of 9 1/2 acres.

Along the main frontage of Euston Road the Library site is flanked on the West by the building owned by Camden Borough which houses a public library at the lower levels and an office building rising above that. The rest of the Western frontage is bounded by a large Public Authority Housing Estate named Levita House. On the Eastern flank lies St. Pancras Station and St. Pancras Chambers Hotel by Sir Gilbert Scott which is arguably on of the masterpieces of the High Victorian Gothic. It is now being cleaned, and will soon have a very striking appearance both in terms of the colour of the brickwork and the silhouette of its roofscape.

Along the Western flank of the site in Ossulston Street there is a series of archways under Levita House which lead through into the parallel street to the West, Chalcott Street, in which it is expected that there will be some growth in the kinds of shops, services and eating places that the presence of the Library will promote. In order to respect the daylight requirements of Levita House the roofline of the Library has been kept as low as possible along the Western frontage.

Along the Eastern frontage (Midland Road) lies the mass of St. Pancras Station and in relation to this it is considered permissible for the Library building to rise to the height of the ridge of the big arched roof of the station:- about 36 M. above pavement level. The Planning Authorites required that the main face of the Library should be far enough back from Euston Road to afford views of the mass of St. Pancras Chambers, and in meeting this requirement an appropriately enclosed forecourt entrance to the Library has evolved and this forms not only a buffer zone against the traffic in Euston Road but also provides an open-air space, sheltered and facing South in which readers and general members of the public could relax. Passing through the centre of the site are the underground tunnels of the Northern and Victoria lines appoximately 21 M. below ground level.

In the overall massing of the proposed design there are two very different ranges of building with a central section which unites them. On the West the range of building houses what is broadly equivalent to the present kinds of readership in the British Museum (that is Printed Books, Manuscripts, Maps, Music and Oriental Manuscripts) and this is designed specifically to provide for the closed- access reading-rooms of the Reference Division. To the East the range of buildings which houses the open-access Reference Division collections of the Science and Patents Reading Rooms. Above those Reading Rooms and in the North East area of the site are the principal offices of the Reference Division, Central Administration Research and Development Department and Bibliographic Services Division. Between these two ranges of building lie the main entrances for the public facing on to the approach forecouort and behind them the catalogue hall which lies at the heart of the building. Beyond this to the North lies the Service and Parking areas.

The design strategy to deal with the need to build in phases takes the form of massive "pylons" which, in containing the primary services, ducting, escape stairs, wet services and vertical book- delivery systems that ensure the self-sufficiency of any completed phase of construction provide also a buffer-zone against the noise and disruption of the next phase of construction work.

The range of building on the West is broken into four sections of Reading Rooms to accord with possible phase-lines.

A typical closed-access Reading Room for the Department of Printed Books has stepped terrace form which disposes the readers in a triple height space. Along one flank of the Reading Room lies the readers' Service Counter served from the vertical book conveyors rising from the main bookstacks below and located in the "pylon" described above.

The Reading Rooms are naturally lit through roof lights and by the tall clerestory windows which will permit light to wash down the inner surface of the sloped roofs. Obviously the main working levels of light will be ensured by artificial means at all times but we consider it very important that the main ambient quality of light in the spaces should be natural daylight since this has the kind of liveliness and variety which brings some kind of stimulus to people working within a large enclosed space all day. This drawing suggests the great variety of spaces and reader positions that the form of the room has to offer.

The range of the building which houses the Science and Technology Reading Rooms have a very different ratio of reader places to open access bookstacks. In this case the kind of reader facilities that are being offered take the form of material on open access in half-height bookstacks disposed along the edges of the galleries and in the main aisle and in full-height stacks which are disposed in depth behind these. The reading positions are spread out along the edges of the gallery and the perimeter of the building where there are normal viewing windows. Readers move around helping themselves to the material and simply consulting it at the nearest reading position that is convenient for them. It is considered very important in such large spaces that the reader, on entering, should be able to take in at a glance the whole working area: and so the Western flank of each Reading Room is opened up to expose its full height and breadth to view.

A typical portion of the office space has also been studied and it is demonstrated that, in spite of the depth of the building, no staff desk should have too remote a view to the outside.

Finally the disposition of the main book storage area is disposed in deep basements ice-berg fashion. The uppermost basement floor has a mechanical conveyor loop connecting the North and South book basements (which at lower levels are divided in order to keep away from the tube tunnels). There is thus a network of horizontal and vertical runs which permit the delivery of books to control points within every reading room or to Staff offices, Conservation Laboratory, Bindery and Photographic Studios etc.

The principal external characteristics of the building derive from the diverse nature of the activities within. The Western range of rooms has a series of pitched roofs which rise up in successive layers and which themselves house the roof lights that we saw in our sketch of the closed-access reading-room. The cores emerge as very powerful, almost butteesslike elements, and it demonstrated how the building itself might be constructed in phases which are reasonably self-sufficient in terms of their structure, their servicing and their environmental control systems because of these buffer zones. On the Eastern range the offices lie on top of the Science Reading Rooms and here there is a very different character to the building, –

conventional flat roofs in a stepped terrace form. This section of the building is structured in a regular modular form in which the spaces, the environmental control systems and the mode of lighting and servicing are broadly constan throughout and accordingly permit a certain degree of adaptability for change in use between open-access Reading Rooms and offices. Lying between these two very different zones is the central "forum" with a big simple roof thrown across the main entrance, and beyond, in the centre the stepped roof-form letting light into the catalogue hall in the heart of the building.

Turning now to our third and final criterion, – the question of the phasing of the building, it has to be understood that for the whole development we are talking of a very large building, (something of the order of two hundred thousand square metres of floorspace) and it is quite obvious that in financial and contractual terms such an enterprise must be phased. This in turn must be reflected in the architectural composition of the building. It has been indicated how the anatomy has been designed to make this a feasible proposition in terms of servicing and buffer zones and in the event the total form is broken down not only into three main Phases but also into lateral sub-stages. Phase I is of special importance since it would be sufficient to accommodate all of the present readership, its book storage and its dependant offices; these will then be all in one place, and to the environmental standards that are essential to the restoration and conservation of the holdings. The design also ensures that on completion of that first phase of building not only will there be a proper and convenient mode of entry for the public across the forecourt but also the characteristic form and image of the building as a National landmark, will have been established on the main frontage to Euston Road.

17-INF-1-E

USER INTERACTION WITH ONLINE CATALOGUE

Stephen Walker, *Polytechnic of Central London, UK*

ABSTRACT

This paper draws on British Library funded research into online catalogues at the Polytechnic of Central London. Online catalogue display screens handle four types of interaction: selection, information, user input and system ouptut. Example screens are given. The author argues that the distinction between menu-type and command-type interfaces is ill-definced. It is possible to make a catalogue system which combines the two approaches. Catalogues which imitate reference retrieval systems such as DIALOG are not suitable for general users. Systems in which the user has to wait for a series of menus to appear may become tedious for experienced users. Nevertheless, users tend to like whatever catalogue they have become accustomed to, whatever its appareth shortcomings. The author urges the development of catalogues which adapt themselves to individual users' requirements.

Introduction

At the Polytechnic of Central London (PCL) we have been engaged in research into online catalogues since 1982. This research has been mainly funded by the British Library Research and Development Department. Our object has been to try to combine ease of use with effectiveness. These projects have resulted in a number of publications, including two substantial reports [1, 2].

Screen displays

Most online catalogues use at least four types of screen displays:

selection
information
user input
system output

This classification really applies to screen windows or sections rather than complete screens. An output screen, for example, may consist of a window at the top giving information about the search which has been done and the number of records retrieved, a window in the middle containing displays of one or more bibliographic records and a window at the bottom indicating what the user can do next (Fig 1).

Nor can a screen or window necessarily be said to fall into only one of these categories. A selection screen generally gives information about the selections. An input screen may be of the labelled, form-filling type where the user is prompted to enter different types of data in different boxes (Fig 2: available from author).

There are a number of general problems with screen displays. Most of the currently used visual display terminals (VDTs) are not particulary readable. Alan Kay has described them as "...hardly better than they were twenty years ago ... almost illegible" [3, p158]. They do not allow the use of typographical devices such as different type faces and sizes. It is necessary to use large amounts of white space to demarcate different data elements on the screen. Even people who are experienced users of computers and catalogues often do not notice instructions which the system designer thinks are quite clearly displayed (Fig 2: available from author). It follows that the number of prompts, instructions or messages on a screen must be quite small – certainly not more than six.

The most serious disadvantage of the conventional VDT is that it can only display 24 lines of 80 characters. This makes scanning large quantities of bibliographic data both tedious and tiring to the eyes. Better display devices are available, but they are still too expensive for many libraries.

Menu systems and command systems

There is no fundamental difference between the two. Most of the more recent systems, at least those in use in the UK, do not fall clearly into one or the other category. One could say that

a menu system is a command system in which the available commands are displayed for selection

a command system is a menu system in which the menu is in the user's head.

Is a catalogue like CSLI's PAC II, in which commands are given (i.e. choices made) by pressing labelled function keys, a menu system or a command-driven system? When one presses a key, is this giving a command or choosing an option?

Some people have defined menu systems as those keyboard- less systems in which the user selects a search type, and then a range of bibliographic records, by touching the screen. In that case, almost all our catalogues must be described as command driven. This is not a useful definition.

I think that what most people think of as a command-driven system is one which behaves rather like the online reference retrieval systems such as DIALOG. Here one can or must specify the fields to be searched, the way in which search terms are to be combined and the display format. These are usually search systems which work by performing post- coordination on indexes of keywords extracted from the bibliographic files.

A menu system may behave in much the same way, but the search process is broken into smaller steps. First the user has to select a type of search (author and title, subject, etc). This is done on a selection screen (Fig 3).

Then the user must type in the search. For author, or author and title, a form filling approach is sometimes used, where the user is prompted for each data element. An example is shown in Fig 2. This makes it easier for the system, and perhaps for the user too. Jean Dickson found that a large proportion of the author search failures in a certain catalogue were due to users entering forename(s) before surnames instead of after them [4]. She suggested that the catalogue could be improved by making it try the effect of altering the order of the words of a failed author search (so that a failed search for "Henry James" would be automatically retried as "James, Henry"). It saves this complication if the user is prompted to enter a surname in one box and forenames in another.

Fig 1 Full record display (Okapi system, PCL)

```
**********************************************************************
SUBJECT SEARCH                  FULL DISPLAY                 Book 3 of 9

'sociology of unemployment in the uk'

----------------------------------------------------------------------
AUTHOR(S)    (THOMPSON K)
TITLE(S)     The unemployed
PUBLICATION  Harrap, May 1984

SUBJECT(S)   Great Britain. Industrial sociology. Employment. Sociological
             perspectives

Not in this branch
No. of copies in other PCL libraries : MRd (1)
                          Shelved at : 306.36 WOR
----------------------------------------------------------------------

RED KEY  to search again or to finish
BLUE KEY to see the PREVIOUS book again      GREEN KEY to see the NEXT book

**********************************************************************
```

Fig 2 Input screen (based on Okapi system, PCL)

```
**********************************************************************
AUTHOR/TITLE SEARCH

AUTHOR (last name only, if a person) : Shakespr.....................

TITLE : ............................................................

Press the GREEN key when you have entered the author

WHITE KEY  to correct what you have typed
BLUE KEY   to start again

RED KEY    to choose a different type of search

**********************************************************************
```

Fig 3 Selection screen (based on the SWALCAP LIBERTAS system)

```
**********************************************************************
Catalogue enquiries

        Code

        AT  AUTHOR/TITLE enquiry
        SU  SUBJECT search
        TI  TITLE enquiry
        AU  AUTHOR listing
        CL  CLASSMARK enquiry

         /  to end
         ?  for explanations

Enter code then press RETURN

**********************************************************************
```

Ease of use and effectiveness

Purely command driven catalogues (like the two systems in use at the Library of Congress) are not suitable for untrained or casual users. Users of such systems need training and they need printed instructions. On the other hand they are quite suitable for experts, and certainly preferable (for experienced users) to systems in which one has to wait for a slow sequence fo menus.

A good menu-based system is instantly usable without any training, but it may become tedious for experienced users. Much depends on the data transmission speed and the amount processing power available. The system response time for displaying a menu should not be more than one second. (This is in contrast to the response time for an actual search, where several seconds or even tens of seconds is quite acceptable, particularly if the user perceives the search to be "difficult".)

An argument which is advanced in favour of command-based systems is that they do, or can, allow more flexibility in the construction of searches and the choice of display formats. When catalogues based on Boolean reference retrieval software were first introduced it was though that they would be the answer to the problems of subject searching in library catalogues. However, it soon became clear that few people are able to construct Boolean searches and combine sets competently, let alone use truncation and "limit" facilities. Christine Borgman found that about a third of Stanford University students were unable to grasp the principles of a very simple Boolean system within an hour or so [5].

Some designers compromised by making the systems assume a Boolean AND between the words of search statements; others designed systems in which a subject search has to consist, initially, of a single word (which can be qualified or limited at a later stage). The latter is obviously inept: many subjects do not have a name which is a single word. The former, which is the method used in the majority of the more recent commercially available catalogues, is far from satisfactory. About half af all subject searches containing three or more words fail to find anything when the words are combined with an AND. One and two-word searches tend to find too much, except in small libraries.

Solutions to the term-combination problem are outside the scope of this talk. It has been tackled in several experimental and commercial catalogue systems, including the National Library of Medicine's CITE, the Polytechnic of Central London's Okapi systems and the LIBERTAS system from SWALCAP Library Services Ltd [6, 1, 2, 7].

Unification of menu and command

The options on the initial selection menu are the command names (Fig 3).

If the user types a selection (command name) followed by a search statement the screen clears instantly, being replaced by the appropriate input screen. When the search has been processed this iks followed by an "information" screen giving the result of the search and a menu of commands for displaying records or for starting another search etc. If there are only a few clearly matching records there would be an automatic bibliographic display. Available commands are listed at the foot of the record display.

A person who is familiar with such a system can use it by typing a command like

SU KIDNEY DISEASE IN CHILDREN

without having to wait for and read instructions and prompts.

Such a system needs plenty of processing power and a high data transmission speed (at least 1000 characters per second). This may best be achieved by using microcomputers as terminals. These would handle screen displays and the initial processing of user input.

Record displays

The best type of layout for bibliographic records is a labelled, tabular display rather than an imitation of a catalogue card [8]. Dark on light is usually regarded as somewhat more readable than light on dark, but the display must be absolutely steady and free from flicker. Colour can be judiciously used to distinguish data delements. A least one of the commercially available systems allows the use of colour, although this again increases the cost of the hardware.

Conclusions It is a fact that people tend to like the catalogue they are familiar with, however bad it may seem to a system designer. If they only had to use one catalogue, some of our problems would disappear. The ideal online catalogue would be something of a chameleon, changing its behaviour to suit the needs of individual users. To quote Alan Kay again, a catalogue should be like a "friendly but slightly deaf butler", who may not understand quite what the user wants but will always do something appropriate [3, p169].

References

1 MITEV N N, VENNER G M and WALKER S. Designing an outline public access catalogue : Okapi, a catalogue on a local area network (Library and Information Research Report 39). London : British Library, 1985.

2 WALKER S and JONES R M. Improving subject retrieval in online catalogues (1). (British Library Research Paper.) London: British Library, 1987.

3 Online catalog screen displays : a series of discussions. Report of a conference sponsored by the Council on Library Resources at the Lakeside Conference Center, Austin, Texas, March 10-13, 1985. Edited by Joan Frye Williams. Washington, D.C. : Council on Library Resources, 1986.

4 DICKSON J. An analysis of user errors in searching an online catalog. Cataloging & Classification Quarterly 4 (3), Spring 1984, 19-38.

5 BORGMAN C L. The user's mental model of an information retrieval system : effects on performance. PhD dissertation, Stanford Univesity, 1983. (Obtainable from University Microfilms International, 300 N. Zeeb Road, Ann Arbor, MI 48106, USA.)

6 DOSZKOCS T. E. Natural language processing in information retrieval. Journal of the American Society for Information Science 37 (4), 1986, 191-196.

7 Towards the implementation of an integrated information system : the introduction of LIBERTAS at the Polytechnic of Central London. Vine (65), December 1986, 3-13.

8 FRYSER B S and STIRLING K H. The effect of spatial arrangement, upper-lower case letter combinations, and reverse video on patron response to CRT displayed catalog records. Journal of the American Society for Information Science 35 (6), 1984, 344-350.

61-PUB-2/INF-2-E

Charging for public library services

J C BEARD *County Librarian, Hampshire County Library, Winchester, UK*

Suggested resolution for session on Charging for public library services

That having considered the report of a Working Group set up by the Section of Public Libraries, it be a recommendation to IFLA that

(a) it re-affirm the concept of a public library service freely available for the borrowing and consultation of books, including the provision of assistance and advice by professional librarians;

(b) charges for computerised information retrieval should only be passed on to the user when added value services are provided at the express wish of the client.

1. In this session I should like to remind members of the work that has been undertaken on the question of direct charges for public library services and the report of the Working Group on Charges which was presented at the IFLA Conference last year in Tokyo.
2. The Working Group considered the various services provided by a public library, the political, social and economic setting in which the library operates, the priorities which are attached to various aspects of service and the impact of information technology. Some comparisons were made between countries where a 'free' (that is, local government taxation supported) service operates and other countries where a charge is made for some services. It was shown that the imposition of charges would:

   (i) impede the free flow of information required for the education and training of an individual through life;

   (ii) lead to a reduction in the number of people able to take advantage of library services because of cost barriers;

   (iii) cost a good deal to implement;

   (iv) lead to a distortion in the pattern of supply to minority and specialist interests by concentrating on the popular and therefore highest revenue earners;

   (v) lead to a loss of standards;

   (vi) produce only a small financial return in real terms;

   (vii) adverse public reaction would make any proposed introduction of charging a politically difficult and undesirable operation.

   Examples drawn from the Netherlands showed a very considerable increase in membership when fees were abolished for children.
3. A dilemma presented itself where computer technology is used in information retrieval. The basic difference compared to print on paper is that each consultation of the database may attract a charge. This has led some to conclude that electronic consultations should be paid for in full by library users – irrespective of the relative worth of the material so produced or the ability of staff to perform more effectively by using electronic aids. In the UK within the last year this problem has been addressed by the Library Association within a wider review of the inter relationship between the public and private sectors. The report sets down the Association's belief in librarians providing free acess to materials.
4. From the use of technology flows the concept of value added services; for example

   (i) a service tailored specifically to an individual client's need;

   (ii) a service which gives priority to speed of supply – the client receives the information more speedily than by normal services

   (iii) a service which orders, explains and packages the information for the benefit of the end user;

   (iv) a service from which an overview of a particular topic can be obtained;

   (v) a service which provides information from a particular source at the express wish of the client.
5. It will be seen that many of these services could legitimately be carried out by private companies or by private sector information consultants. If the work is carried out by the public library should a charge then be made for such services? In seeking to answer this question it may be that the marginal cost of individual provision may show the balance of advantage to lie with funding from the public sector; for example as a library contribution to the concept of social equity or support for the industrial base of a country as exemplified in such information co-operatives as Hertfordshire Technical Information Service (HERTIS) or Hampshire Technical, Research, Industrial and Commercial Service (HATRICS).
6. A clear distinction needs to be drawn between gross income as opposed to net income. In many cases where income is generated within the public sector a true 'profit' is not made if all the overhead costs – staff, premises, equipment and so on – are taken into account.
7. There are peripheral areas of activity within the public library for which charges could, and are, made in certain circumstances:

   (i) those services for which a profit can be seen on each operation (e.g. photocopying);

   (ii) those services considered to be of added value for which a charge is made to cover replacement material costs (e.g. loan of gramophone records);

   (iii) those services for which by law a nominal charge can only be made (e.g. reservation charge for books in the UK);

   (iv) those services provided within the overall framework of the library service and available from time to time on a chargeable basis (e.g. rental of meeting room within a public library);

   (v) those services which are wholly or partially re-charged to other departments or sectors of government.
8. There is, therefore, an evolving pattern of public library use and it is not easy to lay down policies which are generally applicable and which will stand the test of time. However, the Working Group considered that certain ideals and standards were basic to the public library service and that any barrier to books or other materials would lead, almost certainly, to a decline in library use.

84-PUB-3/INFO-3-E

The Electronic Aristocracy: Some causes for concern

Trevor J Haywood, *Dean of Faculty of Computing and Information Studies, City of Birmingham Polytechnic, Perry Barr, Birmingham, UK*

ABSTRACT

A number of economic, political and technological factors are coming together to hinder access for non-profit-purposeful users of public libraries. The holders of information in both electronic and traditional forms are becoming more centralized and more powerful. The relevance of current developments in information technology is questioned, particularly so far as users in less developed countries are concerned. The author sees the public library as humanizing these forces on behalf of less privileged users.

The Unesco Manifesto published to mark International Book Year in 1972 declared that:

"Public libraries are a practical demonstration of democracy's faith in universal education as a continuing and lifelong process ..... and that the public library must be readily accessible, and its doors open for free and equal use by all members of the community ....." This faith overtly and explicitly recognizes that the less advantaged groups in our various societies use public libraries because they are free or at least cheap to use at their point of delivery.

I believe that a number of strands in the economic and political cultures of both developed and less developed societies may conspire to damage this access which we have come to regard as self-evident, and to some extent disenfrachise these non-commercial users.

For the purpose of this Paper I assume that the profit-purposeful consumers of information in, for example, the legal, financial, news, business and pharmaceutical areas can all pay for their information however it is packaged, as they unashamedly pass on their information costs to the consumers of their products or services.

It is the non-profit-purposeful user that I believe to be at risk, not just from the various charging scenarios that are now becoming significant as hurdles and obstacles to easy access, and which John Beard is to talk on later, but from some less obvious, but nonetheless potent movements which are active across a wide political and economic spectrum.

The first of these, and one particularly active in the United Kingdom and Western Europe at the present time, is the establishment of a strong political ethos of private rather than public provision of all kinds of services. This manifests itself in a variety of ways so far as public libraries are concerned. Because it reduces the overall resources

available for *all* public services, it particularly harms those earmarked for libraries as their already small percentage is immediately vulnerable to further reductions.

Some shire counties in the United Kingdom, and some particularly involved with rural as well as urban deprivation, are at the point now where they will actually be dismantling the basic structure of their service. They have cut and cut away their operations to the bone, and for many only the marrow remains. More service points will close, more mobile libraries will stop for less time at fewer places; stocks will grow older, and a fierce economic censorship will insist on the cheap and the popular at the expense of quality in both content and presentation. For the first time in the United Kingdom some public librarians are openly admitting that the 1964 Public Libraries Act is dead and that they can no longer provide a 'comprehensive' service.

One great concomitant of these non-stop cuts in resources is the decline in the number of posts for qualified staff and their replacement with, at best clerical and worst part-time clerical staff. British Library Schools turn out just over 1,000 newly qualifies librarians every year, the wastage retirement rate among staff in all types of library is estimated at around 700, leaving 300 or so newly qualified librarians to find jobs in the 'emerging' or 'alternative' information market place, use their qualifications for something 'completely different', or to join the ranks of the unemployed. Moore' notes that:

"The evidence does, however, point to sustained growth in the immediate future at least".

But most commentators agree that this new emerging market is 'emerging' very slowly.

This descrepancy between posts, clearly needed to give a comprehensive user- orientated service and a political/economic culture which, emphasizes and celebrates private solutions to individual information requirements, has all the ingredients of a long war of attrition. Users of public libraries certainly find it harder to get professional advice, but turning this frustration into anger, and this into political action is not easy, and as with so many other public services the losses often have to be endured before their impact is really felt or understood.

Sensible and effective computerisation of many routine, repetitive, clerical housekeeping tasks has, of course, played a part in reducing staff numbers and from the mid-sixties onwards our hopes were that the extended use of computer power would release professional staff from many of the dull routines (some of which were strangely self-inflicted), that occupied so much of their time. The computer and its acolytes the data-capture device and the on-line VDU would create time for professional staff to get involved with their clients in a more positive, inter-personal and dynamic way. The landscape of the library, and indeed the community outside it, was to be a place of animated and creative exchange between skilled intermediaries and their clients. The computer would 'create' time to release staff for enriching and rewarding work which would bring immeasurable added value to our users; 'A Librarian Somewhere Changes Somebody's Life Every Day' could have been the unashamed slogan of this new release.

It has not happened. They have been released, but by staff re-structuring arrangements that have released many of them out of the system altogether.

Computing power has brought new levels of value and convenience to clients, particularly in the areas of acquisition (speeding up contact with suppliers), catalogue convenience, via easy-to-use on-line-publi-access catalogues, more accurate and convenient circulation systems that cut down on errors and waiting time, and for a few really persuasive clients, a new world of opportunity has opened up, liberated via the use of links to the great remote data-base stores in the USA and Europe.

Most of these computer based services seem to have been around for a long time, they are being improved and refined, but they continue to concentrate on the kind of citation signalling that is of more use to the profit purposeful user than the whole-text delivery systems which users of public library systems would prefer. The world of bibliographic control has got much better as a result of these service, the world of document delivery, outside commercial activities has hardly changed at all. Indeed the comprehensive citation messages of the large databases and computerised union catalogues can often seem a frustrating illusion to public library users, whose expectations are sharply aroused only to be immediatley crushed by the limited delivery that continuing reductions in purchasing power allows.

In parallel with the new 'private-function' ethos of current political and economic imperatives we have almost daily evidence of a growing centralization and narrowing of the agents who own the means of holding, packaging and distributing information. This is a powerful trend among both traditional hardcopy publishers and among the growing band of 'invisible' electronic publishers. Witness the recent almost silent acquisition of Jonathan Cape, Bodley Head, the Hogarth Press, and Chatto and Windus by the American giant Random House: Mr Rupert Murdoch's dominant stake in Collins; Century's merger with Hutchinson; the Octopus acquisition of Mitchell Beasley and the Heimmann group; Associated Book Publishers buying of Routledge and Kegan Paul; Longman's ownership of Pitman; the Penguin spectacular buy-out of Hamish Hamilton, Sphere, Rainbird, Michael Joseph, Viking Press and the New American Library, and Macmillan's acqusition of Sidgwick and Jackson. The overiding theme is a concentration of title ownership in a few corporate hands all doing their major business with the mogols of a few massive bookshop chains. This is book provision by the few for tha many with a vengence and its dangers are legion. For the public library it means less choice, less creativity, less risk, more of the popular and the quick seller, less of the serious and the profound.

This is a world analogous to the Murdoch/Maxwell factor in newspaper ownership and it is all too easily paralleled by the monopolistic tendencies of electronic information providers. Reuters acquisition of Finsbury Data Services (Textline), IP Sharp the Canadian on-line data service, INSTINET the New York company specializing in automated share dealing; Network Utilities; Reveal Software and Wyatts, the suppliers of voice communications for financial dealing rooms, conjures up a science-fiction-like picture of the electronic multi-national owning just about every part of the information system. The Pergamon/Infoline acquisition of the SDC Search Service from the Boroughs Coporation brought 120 databases (with hardly any duplication between them) under one management umbrella 'at a stroke'.

All of these trends, particularly those at work within the electronic information industry, are marked by:

1 A high level of central control.
2 The owners of information are increasingly also owners of the means by which it is transmitted.
3 These owners often also have a diversity of other interests, TV, satellite broadcasting, manufacturing, finance etc., operating on a global scale and their packaging of information on controversial issues is unlikely to be objective when it affects these other interests.
4 Discovering where and when censorship takes place in the electronic arena is almost possible.
5 Confusing pricing structures for electronic services *eg* start-up fees, administration fees, hourly connect charges, telecommunications charges, and search charges, all of which are up front and severe with the added complexity of erratic exhange rates making it difficult to budget for and predict on-line costs.
6 The 'remote' in 'remote data base hosts' really is remote when it comes that can be thousands of miles from their potential clients. I would guess for instance that less developed countries would have considerable difficulty in influencing providers to orientate around their particular cultural and information needs, and in negotiating payment scenarios which recognize the fragility of some of their telecommunications networks and the internal imperatives of a labour rather than a technology intensive society.

These trends place serious responsibilities on public libraries. As the objective custodians of recorded cultures without a political or profit motive to sway them, they alone have the chance to stand aloof from the vested interests as truth-houses open and accessible to all at little or no direct cost.

As I mentioned above one of the dynamics of current electronic information marketing is to target services as a direct support to individual users rather than to intermediaries. This is particularly true of marketing in the commercial sector where early studies by Nicholas, Erbach and Harris[2] suggest that on-line providers are generally unhappy dealing with librarians who they claim do not yet appreciate the true worth of the services they provide:

"As a consequence of all this – and to the universal annoyance of the numerous librarians that we have talked to – hosts bypass the librarians in their marketing apporaches, preferring to go direct to someone like the marketing manager who they believe is far more likely to recognize the financial attractions of on-line".

Making the case for the intermediary function is easier in publi libraries as most of their users are unlikely to be or even want to be, on-line- experts. They rely on skilled staff who use the facilities regularly, keep up-to-date with the inevitable changes in command and search structures, and give them added value by:

(i) Helping with selection for individual relevance.

(ii) Giving advice on what document delivery services can best cope with the choices made.

(iii) Enhancing the value of the information by adding expertise and knowledge. This is most important here as the structure of searching and retrieving information provided in this way tends to encourage a narrow, logic-biased conformity that can exclude valuable, novel, creative and unusual solutions.

(iv) Helping users to overcome the illusion of neutrality associated with electronic information provision, and layering the results with the kind of reality which we associate with assessing hard-copy presentations.

In the context of public librarianship I believe that there is a significant and important social function associated with information gathering which enriches and fulfils us as human beings in ways which are just as important as the information we are seeking. In other words the journey can be as important as the destination, sometimes the journey *is*, or becomes the information.

My vision is of public libraries and public librarians who will humanize and enhance the electronic signals by handling the searching and discovering of the different options revealed with the user almost as a 'shared' experience.

These inter-personal exchanges at or near the point of reception, on both sides, should be important learning events. The profession intermediary cleary explaining the choices and limitations within the database, where there might be any bias and what kind of material might be excluded either by subject or chronology, while the client ecouraged by all this passes on information, both explicit and implicit, which might help narrow the field or enhance the search.

These kind of transactions are an important part of our professional relations with users. They embrace ideas like tolerance, they open our minds to a variety of interpretations, and most of all they help us to discriminate between certain sources and forms of information package, adding to our mental store of signals and signs which we can then apply to new sources of information confidently discarding what we feel to be irrelevant, inaccurate and unreliable and retaining what we feel will be helpful to our users.

This role of monitor-evaluation vis-a-vis electronic providers is not so different from the work that we have always done in relation to hard-copy or audio-visual information packages. However, I do feel that it requires a more sharpened sense of mission, given some of the dangers I have highlighted and certainly a vigorous commitment, among those public librarians involved, to re-train or at least keep up a very high level of personal awareness and self-develpment in the rapidly changing world of computerised information provision.

We will need to be partisan and pushy about the role of the public library as a natural access point to electronic suppliers because:

A As noted above, their marketing strategies will be increasingly targeted at the individual end user and like the early resentment we experienced from some publishers over the success of the public library idea, electronic publishers may begin to insist on special rates or restrictive conditions for public library access.

B The style, content, presentation and emphasis of electronic information provision has been much improved in the past by feedback from library intermediaries and it is important for this to continue as the changes made as a result of this bring benefits to the whole community of users.

C The large audience for non-profit purposeful information will not be served unless public libraries host these new services and bear the brunt of the costs. Tony Cawkell[3] in the searching for 'The Real Information Society" makes the point:

"Unfortunately, complex welfare services devised for ordinary people in need are, in effect, unavailable to many of them because of a lack of clear information. Alternative sources of information are unavailable because, believing that there is no market, commercial providers do not offer services covering welfare, doctors, drungs, solicitors, child care, schools, garden centres or do-it-yourself shops. Thus the library which charges will tend to stock information geared to users who have the ability to pay. Far from enjoying the utopia described in many articles, ordinary people may be excluded from the Information Society if this trend is extended".

The electronic information provider offers us both of concerns and an agenda of challenge. Some of their practices are hostile to the valuable and hard-won ethic of sharing and egalitarianism which has characterized library and information work up until now. More and more hardcopy packages which have traditionally been provided at no additional cost at the point of use, will be discontinued as publishers grasp the narrow economic advantages to be gained from 'renting' material out via connect and search time charges rather than from the one-off or annual purchase by a library. This prospect of on-line being the exclusive mode of access to so much information must be perturbing in societies where so many inequalities already exist and where a naked concentration on the 'market', its size and economic segmentation, differs considerably from the librarians view of 'community'.

Purchasing power by public authorities in many developed countries is unevenly distributed, discrepancies between North and South in the United Kingdom, for example, are already marked by significant differences in the way that the power of information can be put to work. This issue is even more sharply focused in less developed countries.

These countries often have serious problems developing the infrastructure necessary to support and properly exploit electronic publishing media, they are now, and I guess for quite a time to come, reliant on 'benign' western interests for provision, access, licencing etc., all operating within western-style parameters, in western languages and with strong, built-in western assumptions about content, structure and presentation.

These problems are often exacerbated by the often predatory, rarely altruistic sales pitches made by suppliers who invariably use over-optimistic concepts of adaptabliity and versatility in their promotion of electronic rather than print-based packages.

Information in many less developed countries, even in its most traditional forms, is often a commodity outside the economic range and experience of a large portion of the population. Uncontrolled and unplanned electronic storage and retrieval responses, instead of widening could narrow even further the range of options, choices and access points available for ordinary people, accelerating an even stronger elitist domination of key areas of social and economic life.

Two issues are particularly important here:

a) What kind of information is needed by non-profit purposeful users in less developed countries?

b) What value or values do these users associate with information and can they articulate it?

No work has been done in this area covering less developed countries. Simon Bell[4] has contributed an interesting overview of the information problems facing academic and research workers in less developed countries, concluding that:

".....this review will show that much of what is offered is not useful to the type of users who have access. Also, many users and potential users are frustrated by their inability either to contact the possible suppliers or to access and store information if contact is made".

The reality is that the public library user in many less developed countries will want to come at information from a social and linguisitc culture that no western editor of a database could ever get near. This culture would embrace political expectations (particularly in terms of secrecy and the control of information), which, although often present in developed countries, are not so obviously authoritarian and thus not so inhibiting in terms of the open articulation of needs.

Low levels of literacy, the preponderance of 'local' languages, and still strong oral traditions (perhaps this was and is the real paperless society), linked with largely rural based transportation and communications systems that are painful and ineffective most of the time, suggest that the designers of information systems in these places need to 'be in' rather than 'looking at' the communities they are to serve. Much of what is going on at the moment is inappropriate for less developed countries, and will remain so for the forseeable future.

I harbour some hopes that CD-ROM technology can help, it does at least offer full text/illustration delivery at the point of contact with the user, not just citations of difficult to obtain western documents. Also the kind of documents usefully held on CD-ROM, dictionaries, encyclopaedias, reference books, collections of key works in particular subject areas might more often coincide with the kinds of material that public libraries in developing countries could make use of. There are still the high up-front costs of course, a micro-computer, a compatible reader, a monitor, a printer, the search software (not quite right yet but coming on), the as yet expensive production costs and high retail price of the discs themselves (a vigorous home market probably needs to be established before these costs really come down enough to meet the needs of developing countries), and the inevitable English Language, but once acquired they do not depend on the kind of debilitating dial-up and connect charges that access to remote data bases requires.

Public libraries, be they in Newcastle or Liverpool, Tanzania or India have the task of making whatever technology is available relevant to the needs of ordinary people who will measure our success by our ability to help solve their immediate local needs. More often than not these needs are unlikely to be catered for via a less than friendly connection to California.

Librarians must actively use whatever infulence they have over vendors to lift their concerns above what is technologically possible, to new levels of human and social relevance.

Without our energetic partisanship and help, non-profit-purposeful users all over the world will be left sitting outside electronic stately

homes while inside a new breed of hi-tech artistocrats dial up and pull down the blinds.

TREVOR HAYWOOD
June 1987

REFERENCES

1 Nick Moore. The Library and Information Workforce: Study of Supply and Demand. Parker Moore Limited, 1986, BLR&D Report No. 5900.

2 David Nicholas, Gertrud Erbach and Kevin Harris. On-line: Views on costs and cost-effectiveness. Journal of Information Science, Volume 13 (1987) No. 2, pp. 109-115.

3 Tony Cawkell. The Real Information Society. Aslib Information, May 1986. 4 Simon Bell. Information Systems and Operation in Less Developed Countries. Part 1 Planning and Operational Concerns. Journal of Information Science, Volume 12 (1986) No. 5, pp 231-245.

IFLA GENERAL CONFERENCE, BRIGHTON

Division Management and Technology

Section: Information Technology

1987

204-INF-4-E

151

153

CD ROMance

An overview of Compact Disc Read Only Memory

By

Edward M. Kurdyla (OCLC)
and
Kennth C. Harris (OCLC)

Keywords:
CD-ROM
Compact Disc Read Only Memory
Information Technology

For internal use only:

To be brought to meeting no:

115

Remarks:

to be presented orally ☒

for distribution only ☐

Abstract:

Compact Disc Read Only Memory (CD-ROM) is one of several new information technologies which have emerged in recent years. While certain characteristics of the technology, itself, may be revolutionary, its use and its impact should be viewed as evolutionary. CD-ROM based products build upon conventions in publishing, information science, computer science, and other related areas. CD-ROM applications and markets are in their infancy, and their maturation will both shape and be shaped by many factors, including the economics of information and, of course, market needs.

Keywords: CD-ROM, Compact Disc, Compact Disc Read Only Memory, information technology.

Presenting an overview of CD-ROM, or Compact Disc-Read Only Memory, is not unlike presenting an overview of paper, and its uses. The subject is very broad, and many aspects of it could be the subject of long, separate treatises. The so-called CD-ROM industry and CD-ROM markets are actually complex amalgams of different industries and markets which share the common bond of contributing to or utilizing a small optical disc to store and access information. CD-ROM, itself, is not a final product, it is just a small plastic disc. But, when properly designed and processed that small plastic disc, 4.72 inches in diameter, can hold approximately 550 million characters of information, the equivalent of 1500 microcomputer diskettes or two hundred 1000-page books.

Since its commercial introduction about three years ago, CD-ROM technology has found its way into many diverse applications, and rightly so, for it is a useful, efficient, and economic medium for storing and publishing large amounts of information. It is not, however, as some persons have described it, the greatest invention since Guttenberg's perfection of a system of moveable type. CD-ROM as an information delivery medium does not present us with many new basic ideas, it does not necessarily nor automatically alter the way we select and synthesize information into a useful and accessible body of knowledge. CD-ROM in and of itself is

not an electronic information product, anymore than a stack of paper, a well of ink, a spool of thread, and a piece of cloth are books, or printed information products. CD-ROM as an information storage and publishing medium, however, can be used to deliver new forms of information. The function and operation of CD-ROMs can and should intrude, favorably, upon the design, content, utility, and use of the information which they deliver. In the new areas of electronic publishing and information delivery, production methods and delivery mechanisms are an integral part of, and help shape the finished information product far more so than heretofore true with traditional print publishing. But here we must separate CD-ROM as a specific medium from computerized information technologies, in general.

Information technologies include a wide range of products and processes which enable us to create new types of information products. Many of these technologies have been available for a number of years, and continue to grow in sophistication. Many of the technologies are new or just now emerging. CD-ROM utilizes many of the processes long used in online information retrieval, which is only one of the information technologies which have not been properly explored and exploited.

In some instances, the online industry has reshaped the way information is presented and used. More often than not, however, the reshaping has not been for the better, but rather for the worse. Most commercially available, computer searchable databases have been translated from print products. Lost in that translation have been such text attributes as different type fonts, sizes and weights used to provide access and emphasis to the text; graphics and illustrations, legible tables, and the ability to browse text easily. Even many database created specifically for electronic access are modeled on the traditional book. While the linear progression of reading from page one to page 100 is a good method for presenting information in the book, in printed form, it does not work well with the computer screen and it does not take advantage of the random and relational access that can be made available with current indexing and retrieval software.

CD-ROM Technology

While Compact Disc-Read Only Memory must be viewed in the larger context of information technologies, it should also be viewed as a specific type of product utilizing specific technologies, much the way that paperback books and magazines are subsets, or separate products of publishing, and utilize specific technologies for composition and printing.

Generically, CD-ROM conforms to the Phillips/Sony standards established by the two large electronics companies that developed the technology as a derivation of the now ubiquitous compact audio disc. The standards cover the encoding scheme, tracking, error detection and correction, and a number of other technical specifications. (For a complete technical analysis of CD-ROM refer to The Essential Guide To CD-ROM and The New Papyrus cited at the end of this paper.)

When we use the term book we can mean a generic information delivery medium or format, or we can mean a specific volume or title. Similarly, CD-ROM can be viewed as a generic information delivery medium, or format, or it can also be viewed as a specific title.

With either format, a book or a CD-ROM, that specific title is much more than the generic information medium. It is the generic information medium combined with other products, and put through various processes. With a book, this includes creating the information, typesetting or photocomposing the text, page layout and design, printing, and binding.

So, too, a specific product, or title, on CD-ROM is actually

a combination of several products and processes. The most important component is the information. That information must be arranged in a specified manner in order to be read by the computer and then by the user. If the information is to be searchable and manipulable, it must also be indexed. For all of these activities, the information must be translated into a digital binary code, that is, each letter or character is represented by a combination of the digits 1 and 0, which a computer can read as "on" and "off" indicators. ASCII ( ) one of the most common digital binary codes, allows for 128 unique, seven-digit strings of 0s and 1s to represent alphanumeric and special characters. The formatting and indexing of the data, and its translation into digital binary code, is the so-called CD-ROM premastering process, which is quite analogous to the typesetting, designing, and laying out of a book.

Analogous to the printing process of a book is the CD-ROM mastering and replication process. For CD-ROM, a master disc is produced from the premastered data, usually stored on magnetic tapes. The binary coded data is transferred to the master disc by using a small laser beam to burn "pits" and "lands" onto its surface. Pits are small depressions, and lands are the flat spaces from which pits are absent. These correspond to the two digits, 1 and 0, used to represent the

entire cast of characters. The making of the master disc is akin to the making of printing plates. From that master mold, replicates are stamped, or printed.

The analogies to the book work well up to this point. There is, however, an additional, and very important, component of the CD-ROM process and product, namely, computer access. This additional layer of technology, and barrier between the information and the reader, presents both advantages and disadvantages. The advantages are the retrieval capabilities and random access of information through the use of sophisticated retrieval software and a microcomputer. Additionally, once the information is retrieved from the disc, it can be manipulated, edited, with the use of the computer. The disadvantages include the fact that one must have a microcomputer and a CD-ROM reader in the location where one wants to use the information on the disc. Currently, this precludes portability of the information. The information on the disc must be read by another laser beam which reflects light from the pits and lands that were burned into the disc during the mastering process. The reading or playback unit comprising the laser beam is a computer peripheral device various called a CD-ROM drive, CD-ROM reader, or CD-ROM player.

The CD-ROM reader, itself, has limitations. Although it is now possible to connect more than one CD-ROM reader to a single workstation or microcomputer, the process of connecting more than one microcomputer or workstation to one CD-ROM player has not been perfected. Thus, only one user at a time can access the information on the disc. If one did have a CD-ROM encoded with the text of two hundred, 1000-page books, only one person could have access to those books at one time. In printed form, if all 200 books were on a shelf, 200 persons would have access to the same information.

While we have talked about CD-ROM in relation to printed material, it must be understood that CD-ROM technology does offer additional capabilities. Graphics can be stored and displayed, and limited audio capability can be achieved. These additional qualities have been less explored than text only CD-ROM products, but offer great potential for multimedia information products, especially in the educational arena. Complementing CD-ROM in the multimedia technology are CD-I, which stands for Compact Disc Interactive, and CD-V, which stands for Compact Disc Video. Digital Video Interactive, or DVI, which is being developed by RCA, is another technology which will incorporate text, graphics, audio, and full motion video.

CD-ROM Applications

Is CD-ROM an information storage medium? Is it a publishing medium? Is it a document archive medium? Is it a data processing medium? The answer to all of those questions is yes, just as it would be if the questions were asked about the printed page or magnetic tape. The medium is still not the message; but, with pertinent information properly designed for efficient access, CD-ROM is a new tool that can be used to suit many of our needs.

The applications to which CD-ROM has been applied are numerous and very different. A hospital in the United States is storing CAT-Scans of all their patients on CD-ROM. They have indexed it so that it can be searched not only for a specific patient's x-ray or medical record, but also by physiological or anatomical characteristic. CD-ROMs are being used for innumerable navigational and mapping purposes, one of which allows large telephone companies to locate the position of every telephone pole in their territories. Industry is using CD-ROM for the storage of engineering and manufacturing specifications, parts catalogues, and personnel records. Governments are storing archives, regulations, and census data on CD-ROM. Florists who belong to telephone networks for sending flowers to distant areas, now have a CD-ROM that lists the names, addresses, rates, and typical

inventories of all other members of the network.

Applications of CD-ROM in the library and its attendant communities are no less diverse. Traditional abstracting and indexing databases formerly reserved to online retrieval systems now abound on CD-ROM. Local library catalogues, union catalogues for resource sharing and retrospective conversion, and cataloguing systems have proliferated in the past two years. Full text information such as encyclopedias and other reference books are available on CD-ROM.

A brief survey of selected CD-ROM products available from various types of companies in the United States provides a clear indication that CD-ROM technology has been adopted, at least by information providers and publishers. It also indicates that the so-called CD-ROM industry has yet to sort out who should play what role.

Two companies which pioneered in the development of CD-ROM applications in libraries are the Library Corporation and Grolier Electronic Publishing, the former with a product for technical services, the latter with a product for reference services. The Library Corporation introduced its Bibliophile standalone cataloguing system nearly three years ago. Since then, almost every company providing computer based or

microform based library technical services has introduced a CD-ROM version of its product. OCLC has developed a CD-ROM based cataloguing system that is linked to its online cataloguing system, thereby providing cost-saving local cataloguing capability without the loss of access to the comprehensive 17 million record Online Union Catalogue. At the same time, because of the automatic link to the online system from the CD-ROM workstation, new records can continue to be added to further enrich that unique database. Such links between CD-ROM's and online systems will continue to grow, providing greater benefit in terms of greater access and reduced costs.

Grolier's Electronic Encyclopedia, which has been available for several years through more than a dozen online services worldwide, was a CD-ROM pioneer in a number of ways. It was the first major full-text database available on compact disc. It was designed for the end-user, that is, it was designed to incorporate the power of full-text, keyword, and Boolean searching in a way that required no training on the part of the user. The third area in which Grolier pioneered was in pricing. While the printed version of the encyclopedia cost some seven hundred dollars U.S. (U.S.$700), the CD-ROM version was introduced at a price of under two hundred dollars ($200) accurately reflecting the lower

production costs of the product.

Since Grolier introduced its CD-ROM based encyclopaedia in 1985, several other major U.S. publishers have entered the CD-ROM arena. John Wiley & Sons recently introduced four products on CD-ROM, including the venerable Kirk-Othmer Encyclopedia of Chemical Technology, and McGraw-Hill has produced a CD-ROM version of its Encyclopedia of Science and Technology.

Microsoft, the large microcomputer software company which has been one of the largest supporters of CD-ROM technology, has recently announced the Microsoft Bookshelf. This unique product combines ten (10) commonly used reference works on one disc: a dictionary, thesaurus, almanac, postal code directory, quotation dictionary, grammar, and so on. What makes the product even more useful is the fact that it is interactive with the major word processing programs currently in use with microcomputers. While typing a document the user can highlight a word and automatically search for it in the thesaurus, dictionary, almanac or other reference work. Retrieved information can then be automatically copied into the document being composed. The Microsoft Bookshelf is a harbinger not only of the type of products that will soon proliferate but also of their availability and cost.

Microsoft plans to sell the Bookshelf in retail computer stores, at a price of approximately three hundred dollars U.S. (U.S. $300).

CD-ROM Economics

The fact that Microsoft, a software company is producing and marketing the works of several traditional publishers bears some note, as does the fact that retail markets will soon see CD-ROM products in computer stores and, perhaps, bookstores.

From the start of the young CD-ROM industry, prices and costs have varied greatly. The costs of producing CD-ROM based products involve many factors. One, of course, is the value of the information itself. This has always been a somewhat arbitrary decision. The cost of premastering the information, and the cost of the software needed to access and manipulate the information, varies in relation to the sophistication of the software, the amount of the information to be placed on the disc, and the complexity of the information. The actual mastering and replication costs, the manufacturing costs, are the only true fixed costs. In the past three years, these fixed costs have dropped from about twenty thousand dollars U.S. (U.S.$20,000) to three thousand dollars for mastering, and from approximately twenty dollars U.S. (U.S.$20) to five dollars for each replicated disc.

(These prices are based on quantity or volume production for companies dealing directly with disc mastering facilities.) There are additional costs which must be covered by the price of the final product, but which are less obvious to the consumer. As with most computer or technological products, CD-ROM equipment and software require instructions, manintenance, and support. The cost of writing and producing easy and useful documentation or user guides must be included. So, too, in many cases, is the cost of support. If an organization is going to provide free telephone support and assistance, it cannot rely on volunteers from within the organization. Support personnel are highly trained, and paid, employees.

While the factors contributing to the actual costs of the product are fairly straightforward, the economics of the CD-ROM industry and market are less so. To date, no clear production, marketing, and distribution channels have been established. CD-ROM producers include traditional publishers, software companies, systems integrators, library service organizations, and others, sometimes alone, sometimes working together. To return to the analogies to the book, it would be similar if typesetters, printers, distributors, and bookstores decided to start publishing their own books.

Marketing and distribution of CD-ROMs has been as dispersed. Virtually no retail market has existed, although Grolier tried with its encyclopedia; Microsoft's bookshelf should improve the retail outlook. CD-ROM success in the retail arena will have a highly beneficial effect on libraries, as prices will decrease significantly as production volume increases.

There are no central distributors or jobbers. In the United States there are close to 100 CD-ROM titles commercially available, and each title is usually available only from its producer. This requires time consuming activities on the part of the purchasers, and, again, it hinders volume sales or purchases that could lead to lower costs and lower prices.

Most of this confusion in the market is due to the fact that CD-ROM is in its infancy. But, with new producers, publishers, marketers, and distributors entering the information arena, it could take some time before there is a clear and defined CD-ROM infrastructure.

Conclusions

CD-ROM is just one on many new technologies destined to improve our access to and use of multiple types of information. CD-ROM, along with the entire information

technology sector, in general, is in its infancy. We do not fully understand the full potential or capabilities of these technologies, and we have not really defined what are the true information needs of various segments of the population which these new technologies should fulfill. CD-ROM is not revolutionary, it is evolutionary. It builds upon many traditional publishing activities, and it builds upon many developments in computer science. We must view CD-ROM soberly. We should not be awed by the technology; but neither should we ignore its potential. CD-ROM is only the next step along a very long road of innovation which mankind has been roaming for centuries.

For additional information, including extensive bibiliographies, the following books are highly recommended:

Lambert, Steve, and Ropiequet, eds. The New Papyrus: The Current and Future State of the Art. Bellevue, Wash.: Microsoft Press, 1986.

Miller, David C., Special Report: Publishers, Libraries & CD-ROM. Portland, OR: Library and Information Resources for the Northwest, [1987].

Roth, Judith Paris, ed. Essential Guide to CD-ROM. Westport, CT: Meckler Publishing.